**Section 604.515 Sedimentation**

For purposes of this Section, sedimentation is a process that allows particles to settle by gravity and typically precedes filtration. The detention time for effective clarification is dependent upon a number of factors related to basin design and the nature of the raw water. The following criteria apply to conventional sedimentation units:

a) A minimum of four hours of settling time must be provided. This may be reduced to two hours for lime-soda softening facilities treating only groundwater. The Agency may approve reduced detention time when equivalent effective settling is demonstrated or when the overflow rate is not more than 0.5 gpm per square foot.

b) Inlet Devices − Inlets must be designed to distribute the water equally and at uniform velocities by using open ports, submerged ports, and similar entrance arrangements. A baffle should be constructed across the basin close to the inlet end and should project several feet below the water surface to dissipate inlet velocities and provide uniform flows across the basin.

c) Velocity − The velocity through a sedimentation basin must not exceed 0.5 feet per minute. The basins must be designed to minimize short-circuiting. Fixed or adjustable baffles must be provided as necessary to achieve the maximum potential for clarification.

d) Outlet Devices − Outlet weirs or submerged orifices must maintain velocities suitable for settling in the basin and minimize short-circuiting. Submerged orifices must be used if necessary to provide a volume above the orifices for storage when there are fluctuations in flow. Outlet weirs and submerged orifices must be designed as follows:

1) The rate of flow over the outlet weirs or through the submerged orifices must not exceed 20,000 gallons per day per foot of the outlet launder or orifice circumference;

2) Submerged orifices should not be located lower than 3 feet below the flow line; and

3) The entrance velocity through the submerged orifices must not exceed 0.5 feet per second.

e) Overflow − An overflow weir or pipe designed to establish the maximum water level desired on top of the filters should be provided. The overflow must discharge by gravity with a free fall at a location where the discharge can be observed.

f) Drainage – Sedimentation basins must be provided with a means for dewatering. Basin bottoms should slope toward the drain not less than one foot in 12 feet where mechanical sludge collection equipment is not required.

g) Flushing lines − Flushing lines or hydrants must be provided and must be equipped with backflow prevention devices approved by the Agency.

h) Mechanical sludge removal equipment must be provided in the sedimentation basin.

i) Sludge removal design must provide that:

1) sludge pipes will not be less than 3 inches in diameter and so arranged as to facilitate cleaning;

2) entrance to sludge withdrawal piping must prevent clogging;

3) valves must be located outside the tank for accessibility; and

4) the operator may observe and sample sludge being withdrawn from the unit.